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Mycotic Posterior Tibial Artery Aneurysm in a Patient with Diabetes: A Case Report

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1. Abstract

We report the case of a 66-year-old Caucasian man with type 2 diabetes presented with right foot swelling and redness. He was initially managed with intravenous antibiotics for presumed cellulitis; however, there was no clinical improvement. Magnetic resonance imaging (MRI) of the right foot revealed widespread cellulitis associated with posterior tibial artery mycotic aneurysm. The patient underwent urgent vascular ligation of the affected artery, followed by completion of combined course of intravenous and oral antibiotics. He subsequently achieved complete clinical recovery and returned to his baseline functional status.

This case highlights the importance of considering underlying vascular complications such as mycotic aneurysm in diabetic patients with refractory cellulitis. Early imaging and prompt surgical intervention are essential to prevent limb threatening sequelae.

2. Introduction

Diabetic foot infections remain a serious complication of diabetes mellitus and are associated with significant morbidity. They can result in a spectrum of vascular and systemic sequelae. True aneurysms of peripheral arteries are exceedingly rare. Infra popliteal true aneurysms, particularly those involving the posterior tibial artery, have been reported only in a small number of cases worldwide [1]. True aneurysms are mostly associated with an infectious or inflammatory process [2]. We present another such rare occurrence – posterior tibial artery mycotic aneurysm in a patient with diabetic foot infection – highlighting an unusual vascular complication in this patient.

3. Case Presentation

A 66-year-old gentleman with a history of well-controlled type 2 diabetes mellitus on metformin, no prior surgical history and no significant family medical history, presented to the medical same day emergency care with swelling and erythema over the medial aspect of his right foot.

On examination, vital signs were within normal limits, there was no documented fever, and the patient was systemically well. There was marked erythema and swelling over the dorsum of the right foot but other systemic examination findings were unremarkable. He was diagnosed with cellulitis in the context of diabetic foot infection and commenced on Intravenous (IV) ceftriaxone 2 g once a day according to the hospital protocol.

After 3 days of IV ceftriaxone, he continued to experience persistent pain and swelling. Hence, Intravenous ceftriaxone was continued for another two days. By day 5, partial clinical improvement was observed, and he was discharged home on oral antibiotic.

However, he re-presented the following day with worsening pain and increased swelling of the right foot. Clinical examination revealed significant swelling, erythema and marked tenderness especially over the posterior aspect of the ankle. The orthopaedic team reviewed and thought it was cellulitis and advised to continue the same management. But the medical consultant raised suspicion of deep-seated infection and admitted the patient for urgent magnetic resonance imaging (MRI) of the right foot and further management.

The below table showed comparison of key blood results on admission and discharge.

Table 1: key blood test results on admission and at discharge.

	On Admission	On discharge
Haemoglobin (130-170 g/L)	137	120
WBC count (4-10 x10*9 /L)	9.18	5.88
Neutrophil count (2-7 x 10*9/L)	7.90	3.08
C Reactive Protein (< 5mg/L)	231	1.5
Creatinine (59-104 umol/L)	97	81

Blood cultures were obtained a few days after the initiation of antibiotic therapy and unfortunately, showed no microbial growth.

Doppler ultrasonography of the right lower limb confirmed saccular posterior tibial artery aneurysm measuring 2.8 cm in transverse section and 2.9 cm in transverse and longitudinal section respectively.

MRI demonstrated widespread cellulitis with the presence of true posterior tibial artery mycotic aneurysm. [figure 1,2]. The vascular surgery team was urgently consultant, and the patient underwent ligation of the affected artery.

The patient was discharged after 21 days of inpatient care. He was sent home on total six-week course of intravenous teicoplanin and piperacillin-tazobactam, in accordance with the recommendations of the microbiology team.

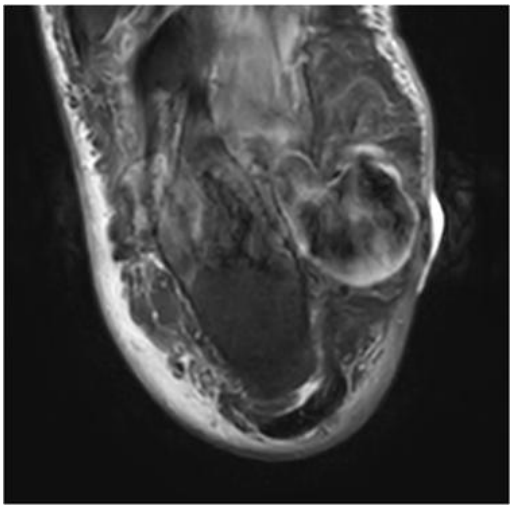

Figure 1: T1 weighted image showing heterogenous soft tissue mass with cystic component and flow voids.

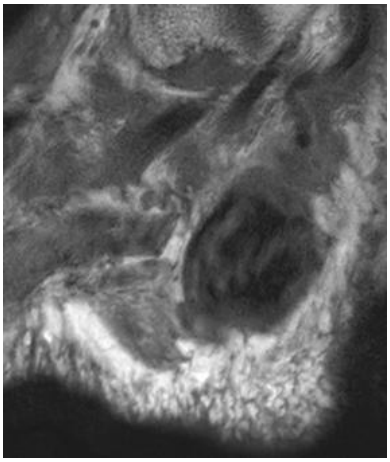

Figure 2: sagittal T1 showing the posterior tibial artery aneurysm.

At follow-up in the vascular outpatient clinic, the surgical wound had healed well, and all laboratory parameters, including CRP and white blood cell counts, had normalised. In line with microbiology advice, antibiotics was changed to oral regime of doxycycline 100 mg BD and ciprofloxacin 500 mg BD for further six weeks. At his most recent review, the patient reported good functional recovery and had returned to his normal daily activities.

4. Discussion

Foot complications are among the most frequent and devastating long-term sequelae of diabetic mellitus. Chronic hyperglycaemia drives metabolic and microvascular injury that culminates in peripheral neuropathy; loss of protective sensation in the foot predisposes patients to unrecognized trauma, repetitive pressure and ulcer formation, which in turns substantially raises the risk of secondary infection, morbidity and amputation [3].

Peripheral arterial disease (PAD) is a well-known chronic complication of diabetes, defined by the presence of atherosclerotic plaques along the peripheral vascular tree, from the sub-aortic segment to the foot. PAD is very common in persons with diabetic foot ulcers (DFUs), involving up to 50% of these patients in middle- and high-income countries [4].

PAD in patients with Diabetic foot ulcer is related to worse outcomes in comparison to pure neuropathic subjects, increasing the risk of non-healing, major amputation, hospital complications and mortality [4,5]. In addition, patients with PAD usually show several attendant comorbidities, mainly cardiovascular, which influence the management and prognosis-importantly, the two comorbidities that often coexist with DFU, heart and renal failure, are independent predictors of amputation and mortality [4-7].

Although atherosclerosis occlusive disease is the common PAD phenotype in diabetes, unusual vascular lesions - including true aneurysms and pseudoaneurysms of infra popliteal arteries such as the posterior tibial artery (PTA) - have been reported and can further compromise distal perfusion [8,9]. PTA aneurysms are extremely rare, but when present they may thrombose, embolize, compress adjacent structures, or otherwise impair perfusion to the planter foot, thereby worsening ischemia and the risk of tissue loss [2].

Diabetic foot complications arise from peripheral neuropathy and impaired arterial perfusion. The 2023 ESVS/IWGDF guidelines emphasize early recognition of ischemia and prompt vascular imaging using duplex ultrasound, CTA, or DSA – to guide

revascularization. Additional vascular lesions such as posterior tibial artery aneurysm, may further reduce distal perfusion. Multidisciplinary management involving vascular surgery, diabetology, orthopaedics, infectious disease, and wound care teams improves healing potential and lowers amputation risk [10].

A mycotic aneurysm is a localised dilatation of an arterial wall caused by infection. The term "mycotic" was first introduced by Sir William Osler in 1885 when describing aneurysms as a complication of infectious endocarditis. Although the name suggests a fungal in origin, most mycotic aneurysms are bacteria with Staphylococcus aureus and Salmonella species being the most common pathogens [11].

The pathogenesis of mycotic aneurysms typically involves hematogenous spread of infection from a distant site, leading to bacteraemia and subsequent infection of the arterial wall. This infection can result in inflammation and weakening of the vessel wall, predisposing it to aneurysmal formation and potential rupture. Septic emboli, originating from conditions like infective endocarditis, can occlude the vasa vasorum, leading to localised ischemia and further compromising the arterial wall's integrity [11].

A mycotic aneurysm of the posterior tibial artery is a rare vascular condition that usually presents with pain, swelling and a pulsating mass in the lower leg or ankle. Patients may also develop numbness or tingling in the foot due to nerve compression [12]. When the aneurysm is infected, the overlying skin can appear warm, red or tender [13].

Serious complications include thrombosis or distal embolization, which can cause limb ischemia [13] and rupture which may lead to sudden bleeding or compartment syndrome [12]. Infected aneurysms also carry a risk of sepsis and in severe cases, limb loss if not treated promptly [12,13].

Laboratory investigations are the first step. Most patients present with evidence of systemic infection. Leucocytosis with neutrophilia, along with elevated ESR and CRP, are common findings. Blood cultures are pivotal as they may isolate the causative organism, most frequently staphylococcus aureus or salmonella species [14,15]. However, up to 30-40% of patients may have negative cultures, either due to prior antibiotic exposure or fastidious organisms. These baseline studies are also important for guiding antibiotic therapy and perioperative planning [14,16].

Imaging investigations provide the cornerstone of the diagnosis. Duplex doppler ultrasonography is usually the first line modality in suspected peripheral aneurysms. It is non-invasive, widely available, and able to demonstrate aneurysmal dilatation, mural thrombus, turbulent flow, and adjacent soft tissue changes [13]. CT angiogram is the gold standard for further evaluation. It provides detailed anatomical information, confirming the presence, size, and morphology of the aneurysm. CT angiogram also demonstrates features suggestive of infection, such as perivascular soft tissue stranding, enhancement or fluid collections. Magnetic resonance angiography (MRA) can be considered in patients where iodinated contrast is contraindicated, offering comparable diagnostic performance [11].

Histopathological examination of the aneurysm wall and tissue cultures obtained during surgery can help identify the causative organism, particularly when blood cultures are negative, guiding targeted antibiotic therapy [11,12].

Management of mycotic posterior tibial artery aneurysms involves prompt intravenous antibiotics to treat infection, often tailored based on blood or tissue cultures. Surgical intervention such as excision or ligation of the aneurysm is usually required to prevent rupture or distal embolization, and revascularization may be performed if limb perfusion is compromised. In selected high-risk patients, endovascular treatments like stent grafting or coil embolization can be considered, with careful antibiotic coverage to prevent graft infection. Supportive care and long term follow up with imaging are also important to monitor for recurrence and ensure limb viability [11,12,13].

5. Conclusion

This case demonstrates that not all diabetic foot infections represent straightforward cellulitis, which typically responds well to standard therapy. The patient's lack of significant clinical improvement prompted further specialist input. Maintaining a high index of suspicion for atypical presentation, urgent imaging was conducted then appropriate specialist referral was made. Early recognition and targeted intervention facilitated accurate diagnosis and appropriate management, emphasizing the critical importance of vigilance, thorough investigation, and multidisciplinary care in patients with diabetes presenting with foot infections.

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